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of the Conjugatae, while the desmids and diatoms are believed to represent two similar and somewhat parallel genetic lines in which the filaments tend to break up rather early into independent cells. The larger part of the paper is occupied by a key to the tribes and genera of the American forms.—CHARLES J. CHAMBERLAIN.

NOTES FOR STUDENTS.

EXPERIMENTS by D. Neljubow⁴ have shown that the peculiar horizontal nutation of stems of seedling peas (*Pisum sativum*) grown in darkness at high temperature is due to the presence of small amounts of illuminating gas in the air of the laboratory. It is especially the acetylene and ethylene components of illuminating gas which are active. SO₂, and vapors of CS₂, xylol, and benzol are very injurious. This peculiar reaction to gas seems to have been unknown before.—C. R. B.

A FEW interesting points regarding the behavior of apples in cold storage are brought out in a bulletin⁵ by L. C. Corbett on this subject. With the exception of York Imperial, the apples of all varieties tested lost less in weight when stored in the light than when kept in darkness. The acid content of the apples was markedly decreased during storage, while the sugar content was decreased in some varieties and increased in others. No explanation for these differences of behavior is attempted.—ERNST A. BESSEY.

A NUMBER of experiments throwing light on the method of infection in pear blight are described in a bulletin⁶ from the Delaware Experiment Station. The germs were introduced by means of needle punctures into terminal shoots, one year old wood, three year old wood, buds, leaves, and fruit. Leaves and young twigs were smeared with cultures of the germ and kept moist for a time. The latter, however did not cause the disease to develop, for it appeared only where the germs had actually been introduced into the tissue, as for example, where needle punctures had been made into the present year's terminal shoots, into buds, leaves, and into the fruit. The punctures into three-year old wood produced only small diseased areas. The author's conclusions are that pear blight is only communicated, as pointed out by Waite, by transference of the germs by honey-seeking insects from nectary to nectary, and into the fruits, young succulent shoots, and leaves by the introduction through bites and punctures of insects of germs clinging to their mouth parts. The same bulletin reports the occurrence in Delaware of pear canker, which seems to be caused by *Sphaeropsis malorum*.

⁴ Beihefte z. Bot. Cent. 10: 128-138. figs. 2. 1901.

⁵ CORBETT, L. C.: Cold storage. Bull. West Virginia Agr. Expt. Sta. 74: 51-80. figs. 1-3. March 1901. Morgantown.

⁶ CHESTER, F. D.: Pear blight and pear canker. Bull. Delaware Agr. Expt. Sta. 52: 1-8. figs. 1-7. April 1901. Newark.

Spraying with Bordeaux mixture is recommended as a preventive measure for this disease.—ERNST A. BESSEY.

DR. BRADLEY M. DAVIS has recently published⁷ some interesting studies on the nucleus of Pellia. These studies were undertaken with the object of extending our knowledge of the cytology of the Hepaticae, and with the hope of throwing some light on the relationships of the various morphological manifestations of kinoplasm. To accomplish this three phases in the life history of the plant were examined, namely sporogenesis, the germination of the spore, and the vegetative activities in the seta. In the spore mother cell the spindles are organized in the same manner as that characteristic of the pteridophytes and spermatophytes. In the stages of spore germination asters with centrospheres were found during the prophase. These appear to be transitory structures, however, as they disappear before the daughter nuclei are formed. In the vegetative cells the spindles are formed in essentially the same fashion as that described by Hof and Némec for the vegetative cells of many spermatophytes. The kinoplasm here forms two caps fitting closely over the ends of the nucleus which has become elongated, and these caps are changed into the poles of the spindle. The writer concludes, however, that the kinoplasmic fibrillae, the centrospheres, and kinoplasmic caps are all secondary developments from the primal granular protoplasm which is the only form of kinoplasm in any sense permanent in the cell. The paper forms an extremely interesting contribution and contains much that is of importance on the cytology of the Hepaticae.—A. A. LAWSON.

CENTROSOMES in flowering plants are described by Bernard⁸ in a series of short papers. From a study of *Lilium candidum*, *L. Martagon* and *Helosis Guayanensis* the writer convinced himself of the presence of the much discussed structures. Material was fixed in alcohol and in Flemming's solution and was stained in a mixture of fuchsin and iodine green (1 per cent. aqueous solution of fuchsin, 2 parts; 1 per cent. aqueous solution of iodine green, 2 parts and water 40 parts). The safranin gentian-violet orange combination did not give as good results.

In *L. candidum* the centrosomes were found quite regularly during various phases in the germination of the megaspore. They resemble the structures described by Guignard, but are not so sharply defined. The centrosome was also identified in the gametophytes of *Helosis*. In *L. Martagon* centrosomes were found in the female gametophyte, in the vegetative cells of the ovule, but could not be positively identified in the endosperm. The centrosome is cytoplasmic in origin.

⁷ Nuclear studies on Pellia. Ann. Bot. 15: 147-180. pls. 10-11. 1901.

⁸ BERNARD, C. H.: Recherches sur les sphères attractives chez *Lilium candidum*, *Helosis Guayanensis*, etc. Jour. de Botanique 14: 118-124, 177-188, 206-212. pls. 4-5. 1900.

Incidentally, it is noted that there are sometimes two embryo sacs in *L. candidum*. In these species a very large vacuole develops between the two polar nuclei preventing the nuclei from fusing. The writer suggests that this may account for the sterility of this species. It is also noted that the upper polar nucleus and the nuclei of the egg and synergids are erythrophilous, while the four nuclei at the antipodal end of the sac are cyanophilous. This difference in chromatophily is attributed to chemical differences due to sexuality, the nuclei at the antipodal end of the sac having lost all sexual character.—CHARLES J. CHAMBERLAIN.

ITEMS OF TAXONOMIC INTEREST are as follows: H. J. BANKER (Bull. Torr. Bot. Club 28: 199-222. 1901) has published a synopsis of the species of *Hydnum*, 40 being recognized, and one described as new.—AVEN NELSON (*idem* 223-235), in his 13th paper entitled "New plants from Wyoming," has described 18 new species and varieties belonging to various families.—DAVID GRIFFITHS (*idem* 236-241) has described a new ergot growing on species of *Hilaria* in Arizona.—MAXWELL T. MASTERS (Bot. Jahrb. Beibl. 29: no. 66. pts. 3-4. 1-20. D1900) has published numerous new species of Restionaceae from the Cape of Good Hope, including a new genus (*Phyllocomos*).—H. CHRIST (Bull. Herb. Boiss. II. 1: 445-460. 1901) has published a number of new species of ferns from Dutch New Guinea.—In Torreyia (1: 41-43. 1901) N. L. BRITTON has described a new *Hieracium* from Florida, E. L. GREENE a new *Arnica* from Oregon, and W. J. BEAL a new *Panicularia* from Colorado.—B. SHIMEK (Bull. Lab. Nat. Hist. Iowa Univ. 5: 139-170. 1901) has published a list of the pteridophytes of Iowa, with stations.—T. MAKINO and K. SHIBATA (Bot. Mag. Tokyo 15: 1-14. *pl.* 1. 1901) have described a new genus (*Sasa*) of Bambuseae, including eight species which have heretofore been referred to *Bambusa*. The name is a common Japanese name for "small bamboos."—Among some recently published notes on algae (Zoe 5: 121-129. 1901) W. A. SETCHELL has described new genera as follows: *Hedophyllum* and *Pleurophycus* (both Laminariaceae), and *Weeksia* (Dumontiaceae).—B. L. ROBINSON (Proc. Am. Acad. 36: 455-488. 1901), in a recent Contribution from the Gray Herbarium, has published as follows: A synopsis of the genus *Melampodium*, 36 species being recognized, 7 of which are new; a synopsis of the genus *Nocca* (Lagascea), 14 species being recognized, 3 of which are new; new species and newly noted synonymy among the spermatophytes of Mexico and Central America, the genus *Eupatorium* receiving 15 new species.—M. L. FERNALD (*idem* 491-506) has described a fascicle of new seed-plants from Mexico and Central America. Among them is a new genus of Euphorbiaceae (Hippomaneae), *Alcoceria* by name.—WILLIAM TRELEASE (Rept. Mo. Bot. Gard. 12: 79-80. *pls.* 35-37. 1901) has published a new palmetto (*Sabal Uresana*) from Sonora.—J. M. C.